REMARKS

Status of the Claims

Claims 1-36 and new claim 37 are pending, with claims 1, 15, 30, and 33 being independent. Claim 30 has been amended to correct a minor typographical error. No new matter has been added. Claim 37 has been added. Support for new claim 37 may be found in the original claims, as well as throughout the specification including, for example, at page 10, paragraph 0039. Therefore, no new matter has been added.

Applicants respectfully request the Examiner to reconsider and withdraw the outstanding rejections in view of the following remarks.

The Present Invention

The present invention relates to an improved processes for producing Fischer Tropsch products through measuring oxygenate concentration using GC-AED. As explained in the specification of the present application, in the purification of Fischer Tropsch products, it is often necessary to achieve and maintain concentrations of ***individual*** oxygenates in a Fischer Tropsch product. Also, as explained in the present specification, using IR techniques, as disclosed in Cook, to monitor oxygenate and olefins has two disadvantages. First, IR techniques require calibration; calibration introduces error because the substance used for calibration may not behave exactly as the compounds in the sample. Second, IR techniques measure only the total concentration of each class of compounds (for example, alcohols, acids, etc.); therefore, they do not provide a distribution by carbon number. In performing and controlling a Fischer Tropsch process, a combined analysis by class and carbon number may be required. (Paragraph 0003).

As control and measurement of specific ***individual*** oxygenate compounds at low levels may be important to producing salable products from Fischer Tropsch processes, the present invention provides techniques that can accurately and efficiently measure oxygenates and control their concentrations to selected set points. (Paragraph 0007).

According to the present invention, it has been discovered that GC-AED is an accurate analytical technique for measuring total oxygenate concentration and specific

individual oxygenate compounds in hydrocarbon products from a Fischer Tropsch process. It is important that the analytical method is sensitive enough to measure both the total oxygenate concentration and differentiate between specific individual oxygenates and thus provide measurements of the specific individual oxygenates. According to the presently claimed invention, in hydrocarbon products from a Fischer Tropsch process, GC-AED may be used to differentiate and measure individual oxygenates (e.g. primary alcohols) within a family of oxygenates (e.g. all alcohols), differentiate different families of oxygenates (e.g., alcohols and acids), and differentiate oxygenates by carbon number distribution. In addition, GC-AED allows for accurate and economical monitoring of very low levels of oxygenates, below the level of reliable detection by other analytical techniques, in hydrocarbon products from a Fischer Tropsch process. The oxygenate measurements obtained using GC-AED may be used to control various operations associated with producing Fischer Tropsch products to provide a product with a desired oxygenate concentration, and if required, a desired oxygenate concentration of specific individual oxygenates. (Paragraph 0035).

Claim Rejections under 35 U.S.C. § 103(a)

Claims 1-36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,895,506 ("Cook") in view of Gas Chromatography December 1997 ("Quimby") and further in view of U.S. Patent No. 6,274,029 ("Wittenbrink"). Applicants respectfully disagree with these rejections; therefore, these rejections are traversed.

Cook discloses a method for controlling a process for producing a distillate fuel heavier than gasoline. The process includes separating the product into several different fractions based on boiling points. The different fraction streams contain alcohols, olefins, and acids. Cook discloses that at least one fraction contains heavy linear primary alcohols and at least one fraction contains lighter linear primary alcohols, olefins, and acids. At least one of the streams is irradiated with IR radiation, allowing the determination of the concentrations of at least one of alcohols, olefins and acids. The temperature of a temperature separator is adjusted to change the concentrations to pre-determined values. Accordingly, Cook uses Infrared (IR)

techniques to monitor oxygenates and olefins in Fischer-Tropsch products separated into fractions to facilitate monitoring by IR.

Quimby discloses an optimized procedure for the analysis of sulfur and nitrogen compounds in gasoline- and diesel-range materials. The analysis is performed using a GC configured with an AED system. Quimby discloses that the procedure for analyzing samples of diesel fuels may also be extended to measure oxygenates, organolead, organomanganese, and organofluorine compounds. Quimby discloses analysis of petroleum feed streams such as California Air Resources Board Low Sulfur Reformulated Gasoline, conventional gasoline, commercial low-sulfur diesel fuels from California.

Wittenbrink discloses diesel fuels or blending stocks having excellent lubricity, oxidative stability and high cetane number produced from non-shifting Fischer-Tropsch processes by separating the Fischer-Tropsch product into a lighter and heavier fraction, subjecting the heavier fraction to hydro-treating, and combining the heavier hydrotreated product with the lighter fraction, which has not been hydrotreated. The resulting fuel of Wittenbrink comprises a 200-700°F fraction that contains about 0.001 to less than 0.3 wt% oxygen (water free basis). (claim 1 and Column 5, Lines 48-53).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

As recited in independent claim 1, the present invention relates to a method for producing a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species. The method comprises selecting a concentration of oxygenated species in the substantially paraffinic Fischer-Tropsch product. A Fischer-Tropsch synthesis is performed to provide a Fischer-Tropsch product stream. A substantially paraffinic product stream comprising oxygenated species is isolated from the Fischer-Tropsch product stream. The substantially paraffinic product stream is purified to remove a portion of oxygenated species to provide a substantially paraffinic Fischer-

Tropsch product comprising at least one oxygenated species. The substantially paraffinic Fischer-Tropsch product is monitored for concentration of oxygenated species by GC-AED, and the conditions of the purification are adjusted to ensure that the concentration of the oxygenated species in the substantially paraffinic Fischer-Tropsch product complies with the selected concentration. Claims 2 – 14 and 37 are dependent upon claim 1 and thus recite additional features.

It is respectfully submitted that even if combined the cited art does not teach or suggest all of the limitations of claim 1. Cook discloses using IR techniques to monitor oxygenates and olefins in Fischer-Tropsch products ***separated into fractions*** to facilitate monitoring by IR. As noted above, IR techniques measure only the total concentration of each class of compounds. In addition, Quimby discloses procedures for analyzing samples of final diesel fuels derived from petroleum feed streams. Wittenbrink merely discloses a diesel fuel or blending stock comprising a 200-700°F fraction that contains about 0.001 to less than 0.3 wt% oxygen (water free basis).

Accordingly, it is respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest selecting a concentration of ***an oxygenated species*** in a substantially paraffinic Fischer-Tropsch product. It is also respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest purifying a Fischer Tropsch product stream to remove a portion of oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species. It is further respectfully submitted that Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest monitoring the purified stream for concentration of oxygenated species by GC-AED, and adjusting the conditions of the purification to ensure that the concentration of the oxygenated species in the substantially paraffinic Fischer-Tropsch product complies with the selected concentration. For at least the above-noted reasons, the withdrawal of the obviousness rejection of Claims 1 – 14 is respectfully requested.

As recited in independent claim 15, the presently claimed invention relates to a method for preparing a blended Fischer-Tropsch product, comprising at least one oxygenated species, comprising selecting a concentration of ***an oxygenated species*** in

the blended Fischer-Tropsch product. A Fischer-Tropsch synthesis is performed to provide a Fischer-Tropsch product stream. A substantially paraffinic product stream comprising oxygenated species is isolated from the Fischer-Tropsch product stream. The substantially paraffinic product stream is blended with at least one non-oxygenate containing hydrocarbon stream to provide a blended product comprising at least one oxygenated species. The blended product is monitored for concentration of oxygenated species by GC-AED, and the blending ratio is adjusted to ensure that the concentration of the oxygenated species in the blended product complies with the selected concentration. Claims 16 – 29 are dependent upon claim 15 and thus recite additional features.

It is respectfully submitted that even if combined the cited art does not teach or suggest all of the limitations of claim 15. Cook discloses using IR techniques to monitor oxygenates and olefins in Fischer-Tropsch products ***separated into fractions*** to facilitate monitoring by IR. As noted above, IR techniques measure only the total concentration of each class of compounds. In addition, Quimby discloses procedures for analyzing samples of final diesel fuels derived from petroleum feed streams. Wittenbrink merely discloses a diesel fuel or blending stock comprising a 200-700°F fraction that contains about 0.001 to less than 0.3 wt% oxygen (water free basis).

Accordingly, it is respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest selecting a concentration of ***an oxygenated species*** in the blended Fischer-Tropsch product. It is further respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest blending a substantially paraffinic product stream comprising oxygenated species and at least one non-oxygenate containing hydrocarbon stream to provide a blended product comprising at least one oxygenated species, monitoring for concentration of oxygenated species by GC-AED, and adjusting the blending ratio to ensure that the concentration of the oxygenated species in the blended product complies with the selected concentration. For at least the above-noted reasons, the withdrawal of the obviousness rejection of Claims 15 – 29 is respectfully requested.

As recited in independent claim 30, the presently claimed invention relates to an integrated process for preparing a blended Fischer-Tropsch product, comprising at least one oxygenated species, comprising producing a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species. A concentration and carbon number distribution of oxygenated species in the blended Fischer-Tropsch product in selected. The substantially paraffinic Fischer-Tropsch product is blended with at least one non-oxygenate containing hydrocarbon stream to provide a blended product comprising at least one oxygenated species. The blended product is monitored for concentration and carbon number distribution of oxygenated species by GC-AED. The blending ratio is adjusted to ensure that the concentration and carbon number distribution of the oxygenated species in the blended product comply with the selected concentration and carbon number distribution.

To produce the substantially paraffinic Fischer-Tropsch product a concentration and carbon number distribution of oxygenated species in the substantially paraffinic Fischer-Tropsch product are selected; a Fischer-Tropsch synthesis is performed to provide a Fischer-Tropsch product stream; a substantially paraffinic product stream comprising oxygenated species is isolated from the Fischer-Tropsch product stream; the substantially paraffinic product stream is purified in a purification process to remove a portion of oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species, the substantially paraffinic Fischer-Tropsch product is monitored for concentration and carbon number distribution of oxygenated species by GC-AED, and the conditions of the purification are adjusted to ensure that the concentration and carbon number distribution of the oxygenated species in the substantially paraffinic Fischer-Tropsch product comply with the selected concentration and carbon number distribution. Claims 31 and 32 are dependent upon claim 30 and thus recite additional features.

It is respectfully submitted that even if combined the cited art does not teach or suggest all of the limitations of claim 30. Cook discloses using IR techniques to monitor oxygenates and olefins in Fischer-Tropsch products ***separated into fractions*** to facilitate monitoring by IR. As noted above, IR techniques measure only the total

concentration of each class of compounds. In addition, Quimby discloses procedures for analyzing samples of final diesel fuels derived from petroleum feed streams. Wittenbrink merely discloses a diesel fuel or blending stock comprising a 200-700°F fraction that contains about 0.001 to less than 0.3 wt% oxygen (water free basis).

Accordingly, it is respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest selecting a concentration of ***an oxygenated species and carbon number distribution of oxygenated species*** in the blended Fischer-Tropsch product. It is also respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest blending a substantially paraffinic product stream comprising oxygenated species and at least one non-oxygenate containing hydrocarbon stream to provide a blended product comprising at least one oxygenated species, monitoring for ***concentration and carbon number distribution*** of oxygenated species by GC-AED, and adjusting the blending ratio to ensure that the concentration and carbon number distribution of the oxygenated species in the blended product comply with the selected concentration and carbon number distribution.

It is further respectfully submitted that Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest producing a substantially paraffinic product stream comprising oxygenated species to be used to provide a blended product by a process comprising selecting a concentration and carbon number distribution of oxygenated species in the substantially paraffinic Fischer-Tropsch product; purifying the substantially paraffinic product stream in a purification process to remove a portion of oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species; monitoring the substantially paraffinic Fischer-Tropsch product for concentration and carbon number distribution of oxygenated species by GC-AED; and adjusting the conditions of the purification to ensure that the concentration and carbon number distribution of the oxygenated species in the substantially paraffinic Fischer-Tropsch product comply with the selected concentration and carbon number distribution.

For at least the above-noted reasons, the withdrawal of the obviousness rejection of Claims 30 – 32 is respectfully requested.

As recited in independent claim 33, the present invention relates to a method for controlling a process for producing a substantially paraffinic Fischer-Tropsch product comprising no detectable oxygenated species comprising performing a Fischer-Tropsch synthesis to provide a Fischer-Tropsch product stream. A substantially paraffinic product stream comprising oxygenated species is isolated from the Fischer-Tropsch product stream. The substantially paraffinic product stream is purified to remove oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising ***no detectable*** oxygenated species. The substantially paraffinic Fischer-Tropsch product is monitored for concentration of oxygenated species by GC-AED. The conditions of the purification are adjusted to ensure that the concentration of oxygenated species in the substantially paraffinic Fischer-Tropsch product is not detectable. Claims 34 – 36 are dependent upon claim 33 and thus recite additional features.

It is respectfully submitted that even if combined the cited art does not teach or suggest all of the limitations of claim 33. Cook discloses using IR techniques to monitor oxygenates and olefins in Fischer-Tropsch products ***separated into fractions*** to facilitate monitoring by IR. As noted above, IR techniques measure only the total concentration of each class of compounds. In addition, Quimby discloses procedures for analyzing samples of final diesel fuels derived from petroleum feed streams. Wittenbrink merely discloses a diesel fuel or blending stock comprising a 200-700°F fraction that contains about 0.001 to less than 0.3 wt% oxygen (water free basis).

Accordingly, it is respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest purifying the substantially paraffinic product stream to remove oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising ***no detectable*** oxygenated species. It is further respectfully submitted that even if combined, Cook in view of Quimby and further in view of Wittenbrink do not disclose or suggest monitoring the substantially paraffinic Fischer-Tropsch product for concentration of oxygenated species by GC-AED and adjusting the conditions of the purification to ensure that the concentration of oxygenated species in the substantially paraffinic Fischer-Tropsch

product is not detectable. For at least the above-noted reasons, the withdrawal of the obviousness rejection of Claims 33 – 36 is respectfully requested.

Moreover, it is respectfully submitted that there is no suggestion or motivation to combine the reference teachings of Cook, Quimby, and Wittenbrink. Cook, which describes the use of IR techniques to monitor oxygenates and olefins in Fischer-Tropsch products ***separated into fractions***, does not recognize the disadvantages associated with IR techniques, as outlined in the specification of the present application. Quimby merely discloses using a GC-AED system for analyzing samples of final diesel fuels derived from petroleum feed streams such as California Air Resources Board Low Sulfur Reformulated Gasoline and conventional gasoline. Wittenbrink discloses a process for making a diesel fuel or blending stock. The diesel fuel or blending stock made by the recited process of Wittenbrink comprises a 200-700°F fraction that contains about 0.001 to less than 0.3 wt% oxygen (water free basis) made by a specific process. None of the cited art provides any suggestion or motivation to replace the IR techniques of Cook (used to analyze separate fractions) with the GC-AED of Quimby (used to analyze petroleum feed streams) to provide a method for producing Fischer-Tropsch products using an analysis of the products for concentration and optionally carbon number distribution of individual oxygenate compounds. Wittenbrink, which discloses diesel fuels or blending stocks produced from a specific Fischer-Tropsch process, is not relevant in this regard.

Accordingly, it is respectfully submitted that due to the marked difference in the teachings of Cook, Quimby, and Wittenbrink, there is no suggestion or motivation to combine any of the features of Cook with Quimby and Wittenbrink to obtain the methods of the present invention. As a result, such a combination is improper and results in impermissible hindsight. The Office Action has merely attempted to abstract individual teachings from the different pieces of prior art to create the combination upon which the rejection of the present claims was based. This is an error as a matter of law. *W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 1552, 220 USPQ 303 312 (Fed. Cir. 1983).

Accordingly, withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Conclusion

For the reasons noted above, the art of record does not disclose or suggest the inventive concept of the present invention as defined by the claims.

In view of the foregoing remarks, reconsideration of the claims and allowance of the subject application is earnestly solicited. The Examiner is invited to contact the undersigned at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted,

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Date: December 15, 2003